

“STERILITY IS LAID.”

PROF. VILLE'S
NEW SYSTEM OF AGRICULTURE.

AN ADDRESS

DELIVERED BEFORE THE
BEDFORD, N. H., FARMERS' CLUB,

FEBRUARY 28, 1868.

BY

JOHN A. RIDDELL, ESQ.

Published by Request of Club.

PRICE TWENTY-FIVE CENTS.

Address SOLOMON MANNING, *Sec'y of Club*, Bedford, N. H.,
Or JOHN A. RIDDELL, Manchester, N. H.

MANCHESTER:

PRINTED BY CHARLES F. LIVINGSTON, SMYTH'S BLOCK.

1868.

“STERILITY IS LAID.”

PROF. VILLE'S
NEW SYSTEM OF AGRICULTURE.

AN ADDRESS

DELIVERED BEFORE THE

BEDFORD, N. H., FARMERS' CLUB,

FEBRUARY 28, 1868.

BY

JOHN A. RIDDLER, ESQ.

(1)
Published by Request of Club.

PRICE TWENTY-FIVE CENTS.

Address SOLOMON MANNING, *Sec'y of Club*, Bedford, N. H.,
Or JOHN A. RIDDLER, Manchester, N. H.

MANCHESTER:

PRINTED BY CHARLES F. LIVINGSTON, SMYTH'S BLOCK.

1868.

BEDFORD (N. H.) FARMERS' CLUB.

COL. GEORGE W. RIDDLE, *Chairman.*
SOLOMON MANNING, Esq., *Secretary.*

NEW HAMPSHIRE STATE AGRICULTURAL SOCIETY.

HON. FREDERICK SMYTH, Manchester, *President.*
AARON YOUNG, Esq., Portsmouth, *Secretary.*
COL. GEORGE W. RIDDLE, Bedford, *Treasurer.*
GEN. NATT HEAD, Hooksett.

DIRECTORS.

HON. DAVID GILLIS, Nashua.
WARREN F. DANIELL, Esq., Franklin.
EDWARD GUSTINE, Esq., Keene.
J. W. COGSWELL, Esq., Gilmanton.

A D D R E S S.

It has long been conceded that if the ordinary farmer could ascertain the essential constituents of the soil of each field he was cultivating, so that he could adapt his crops to the soil, it would be of vast advantage to him.

In this early day of Agricultural Colleges, few farmers possess the requisite knowledge to make an analysis of soils in accordance with present chemical rules ; and if they did, such are the imperfections of that system that little practical good would be derived therefrom.

While we were engaged in suppressing a gigantic rebellion which threatened the very life of our country, a man in Europe, having every advantage of position and science, perfected a system, which, having been tested from flower-pots to large fields, culminated in presence of hundreds of farmers and others who had met to witness the crops as they were being harvested, and convinced the most incredulous.

An English writer says : " It is not extravagant in stating that light has thus replaced darkness ; that order has succeeded chaos, and that the phantom of sterility is laid."

An American writer says : " It is impossible to doubt or question the importance of his investigations."

For four years previous to 1864, many curious visitors were shown plots of ground manured and sown in accordance with Prof. VILLE's system. Some of them had been planted four times in succession with the same kind of crop, giving at the commencement what he calls a complete manure, and adding yearly the ingredients principally absorbed by the crop. Upon others the crops were changed yearly, so that each year the particular crop required principally a different agent, then, after passing through the series furnished by the complete manure, the ingredient principally re-

quired by the crop proposed should be added till the crop showed, by a falling off, that the complete manure was again wanted. Under these circumstances the crops reached to results of irrefutable eloquence. Still other plots with one and another of the elements omitted, in which vegetation was feeble and almost nothing in proportion to the quantity and quality of the element omitted, thus furnishing a means of ascertaining the comparative richness of soils.

Agriculture has little need to concern itself about the ingredients which are found in sufficient quantity in nearly all soils, as silica, alumina, manganese, iron, chlorine, etc.; but to those which exist in slight proportions, and which are *essential* to the growth of plants, since vegetation is impossible without them, as phosphate of lime, potash, and lime.

Each plant contains all these essentials; but in different proportions, as wheat, corn, barley, rye, etc., contain more phosphate; beans, peas, potatoes, etc., both phosphate and potash; hay, etc., more lime. The phosphate of lime is largely obtained from bone, and no farmer should allow a single one to be lost. Dr. NICHOLS, in his "Chemistry of the Farm and Sea," gives the following directions for preparing bones:

"Take a sound common molasses cask, divide in the middle with a saw, into one half of this place half a barrel of *finely-ground* bone, and moisten it with two buckets of water, using a hoe in mixing. Have ready a carboy of oil of vitriol and a stone pitcher holding one gallon. Turn out this full of the acid, and gradually add it to the bone, constantly stirring. As soon as effervescence subsides, fill it again with acid and add as before; allow it to remain over night, and in the morning repeat the operation, adding two more gallons of acid. When the mass is quiet, add about two gallons more of water, and then gradually mix the remaining half barrel of bone and allow it to rest. The next day it may be spread upon a floor, where it will dry speedily if the weather is warm. A barrel of good loam may be mixed with it in drying. It may be beaten fine with a mallet, or ground in a plaster mill. If several casks are used, two men can prepare a ton of excellent superphosphate after this method in a day's time.

Again, "Take 100 lbs. of bone beaten into fragments small as possible, pack them in a tight cask or box with 100 lbs. of good

wood ashes ; mix with the ashes before packing 25 lbs. of slaked lime and 12 lbs. of salsoda, powdered fine. It will require about 20 gallons of water to saturate the mass, but more may be added from time to time to maintain moisture. In two or three weeks the bones will be broken down completely, and the whole mass may be turned out upon a floor, and mixed with two bushels of dry peat or good soil and after drying it is fit for use."

Extensive quarries of minerals, containing a large per cent. of phosphate of lime, are found scattered over the surface of the earth, in chalk, coprolites, fossil bones, nodules, apatite, &c.

Potash is principally obtained from wood ashes ; other sources are becoming known, as the water of the first washing of greasy wool, the mother waters in the manufacture of salt, felspathic rocks, &c. A French agricultural writer, alluding to the large quantity of potash received from America, says: "It is an excellent thing that the wild desert should be impoverished to enrich the industry of civilized countries."

Lime is obtained from the inexhaustible beds of limestone throughout the country.

These essential elements combined with a nitrogenous matter, and added to any kind of soil, suffice to render it fertile—with them plants can actually be fabricated.

Nitrogenous matter is that which contains nitrogen in a suitable condition for vegetation, as ammoniacal salts or nitrates. The sources of nitrogen are the air, ammonia from gas works and sewage water, nitrate of soda (saltpeter), decomposed animal matter, urine, &c. (The urine of a single individual is estimated to be of more value in a year than a cord of manure.) No dead animal should be thrown away, but put into the compost heap to make a very rich and valuable manure—a slight covering of muck or loam will absorb the ammonia so as to render it inoffensive.

Prof. VILLE, a scientific Frenchman, after fifteen years' experimenting, substituted for soil an artificial mixture, all the elements of which were clearly defined. In this way he succeeded in producing vegetation in pots of china with burnt sand and perfectly pure chemicals. Under these circumstances he carried on the four following experiments, viz :

1. Burnt sand alone.
2. Sand with a nitrogenous substance.

3. Sand with minerals only. (Phosphate of lime, potash and lime.)

4. Sand with the nitrogenous substance and minerals.

He sowed on the same day, in each pot, 20 grains of the same wheat, of the same weight and kept them moist with distilled water during the entire period of vegetation. At the harvest the following facts were observed, viz:

No. 1. The plant was very feeble, the crop dried, weighed only 93 grains.

No. 2. The crop still very poor, was, however, better than No. 1,—it weighed 140 grains.

No. 3. It was a little inferior to the preceding,—it weighed 123 grains.

No. 4. It weighed 370 grains.

From these experiments we conclude that each of the agents fulfills a separate and a combined action, as the effect in combination was much better than that produced separately.

With nitrates, lime and potash, leaving out the phosphate of lime, vegetation is not possible—the seeds germinated and scarcely arrived at four inches in height; the plants withered and died. A mixture of lime and potash is, therefore, injurious to vegetation, unless united with phosphate of lime. If with the same agents a trace (one hundred thousandth) of phosphate of lime be added you will obtain a plant—meagre, it is true, but which does not wither and die.

With phosphate of lime in sufficient quantity, the crop rises to 370 grains. If the potash be left out the plant does not die, but the crop is inferior to that given by nitrates alone,—it descends to 123 grains. Potash is then less indispensable than phosphate of lime, as its absence does not, as with the phosphate, cause the death of the plants. Experiment has shown that soda cannot be substituted for potash. No substitute of the essential elements of plant-food is possible—the plant detects the slightest shade of difference. Without potash, soda exercises no influence upon the yield—therefore with regard to wheat, potash is of the first importance.*

*GEORGE E. WHITE, Esq., of New York, says; "Experiments have led me to believe that with sulphate of soda substituted for potash in the formula, the same or nearly the same result is obtained.

In the absence of lime, the crop weighed 340 grains instead of 370 with the combined agents or *complete manure*.

This seems to indicate that lime plays only a secondary part, but practice obtains very good effects from its use.

Substitute sand and *humus* (vegetable mould) for sand without lime, the yield remains the same, 340 grains—the humus has no action either useful or injurious, but if we add the lime (in the state of carbonate) in this same experiment, the yield rises to 493 grains.

The seed being equal to 1; the crop with complete manure equals 23; less nitrates, 8.83; less potash, 6.57; less phosphate of lime, 0.77 and died; less lime, 21.62; add humus, 33.35.

The lime, which in the absence of all organic matter, influences the yield but little, manifests a very decisive action in the presence of humus. Humus, alone, produces no effect.

These experiments show that to produce plants, the soil must contain, in a condition suitable for plants, nitrates, phosphate of lime, potash and lime, and to assure the benefit of the lime the presence of humus is indispensable.

It will now be seen why agricultural experiments made upon soils more or less fertile have not, and cannot lead to any practical conclusion.

If an agriculturist had the idea of adding to a field already containing phosphate of lime, a manure containing nitrogenous matter, potash and lime he would obtain a magnificent harvest—he would sound the praises of his manure. Others, trying the same experiments, upon fields which happen to contain no phosphate of lime, will be sadly disappointed, as this manure will *lower* the yield, and will be *injurious*, unless accompanied by phosphate of lime.

We have seen that four essential agents are sufficient to assure fertility of soils, and that the suppression of one of them lowers the yield to a very important extent. If a soil is naturally provided with phosphates, its suppression in the manure will produce no bad effect. Whenever the manure without phosphates produces a crop equal to that which does contain it, we may conclude that the soil is naturally provided with it. The same holds good in regard to lime, potash and nitrates. Cultivate the same soil with manure deficient in each, and according as they produce good

or bad crops, draw your conclusions as to the presence or absence of these agents of fertility.

This new method banishes all hypothesis, as it rests upon the following facts, proved by experience, viz :

1. Minerals and assimilable nitrates produce good crops everywhere ; used separately, they are always without effect.
2. Lime is useful only in presence of humus.
3. Lime and humus produce great effects only in presence of minerals and nitrates.

This method adapts itself to all the wants of the farmer, since, it is sufficient to scatter a few handfuls of a known fertilizing manure upon a field to indicate, at the time of harvest, what the soil contains, what it wants and consequently what must be added to it to render it fertile.

It is *practicable* as it requires no difficult manipulation, no apparatus, and employs only the usual processes of cultivation.

The following are the results obtained in three different soils, compared with those given by burnt sand under similar conditions :

	Without manure.	Complete manure.	COMPLETE MANURE.					
			Without nitrogenous matter.	Without phosphate of lime.	Without potash.	Without lime.	With humus.	
BURNT SAND.....	6	24	8	0	7	22	32	
No. 1.....	5 $\frac{1}{2}$	32	9	6	8	22	.....
No. 2.....	4	29	16	9	18	.....	.....
No. 3	11	55	20	28	28	32	.....

Reasoning in the same manner with regard to the other elements, it contains neither nitrates, potash, nor lime since in their absence it is not more fertile than burnt sand ; on the other hand, it contains traces of phosphate of lime, for, where it was not added, it yielded a light crop, while in the sand the plants invariably perished.

The soil of No. 2 contains humus, a little nitrogenous matter, a little potash and a very small quantity of phosphates.

The soil of No. 3 is rich in humus, phosphates, potash and lime, but poor in nitrates.

These are positive data, which we can employ in fertilizing soils, let us see to what extent they were verified in practice on a large scale.

W H E A T . — C R O P P E R A C R E .

AVERAGE OF THREE YEARS CROPS.

	Complete manure.	Without nitrates.	Without minerals.	Without potash.	Without phosphates.
STRAW.....	lbs. 11,001	lbs. 6,952	lbs. 8,580	lbs. 10,117	lbs. 11,059
GRAIN.....	5,903	3,617	4,313	4,721	4,825
	16,904	10,569	12,893	14,838	15,884

This table shows that without phosphates the crop was nearly equal to that with a complete manure—without potash, it sensibly diminished; without nitrogenous matter, it was very inferior. The *complete manure* gives an increase over that without nitrates, 60 per cent.; without minerals, 31 per cent.; without potash, 15 per cent.; without phosphate, 7 per cent. These results are almost exactly like those derived from experiments on a small scale.

The plant, therefore, becomes one of the most perfect instruments of analysis, the only one in the present state of science, capable of making known, practically, the composition of soils.

Burnt sand and complete manure without phosphate causes the death of plants.

In the soil from No. 1, the same compound, gave a crop equal to 6, which proves small quantities of phosphate of lime in the soil, if one hundred-thousandth of phosphate of lime be added

to the burnt sand and complete manure, except phosphate, the yield rises to 6, showing with certainty the presence of one hundred thousandth of phosphate of lime in the soil of No. 1.

The accuracy of this method in relation to the other elements is no less remarkable. Three ten-thousandths of potash cause the yield to pass from 8 to 32. One ten-thousandth of lime, in presence of humus, raises it from 12 to 24. We are then in possession of a means of analysis, the perfection of which yields in no respect to the most delicate processes of the chemical laboratory, the results of which are verified exactly by cultivation on large scale, capable, consequently, of throwing a sure light upon agricultural operations. To put it into practice, the agriculturist will only have to reserve some square plots in a field, to which he will give complete and partial manures of the following composition for the surface of an acre:

	Complete manure.	Without nitrogenous matter.	Without potash.	Without phosphate.	Without lime.
Nitrate of Soda. (Nitrogenous matter).....	488 lbs.	.....	488 lbs.	488 lbs.	488 lbs.
Carbonate of Potash.....	352 "	352 lbs.	.....	352 "	352 "
Phosphate of Lime.....	352 "	352 "	352 lbs.	.....	352 "
Quick Lime.....	132 "	132 "	132 "	132 lbs.	.....

At the harvest he will carefully note the results obtained, and for the following year he will fix upon that which his soil requires, and, consequently, upon that which he must add to render it fertile. Dr. NICHOLS, in his "Chemistry of the Farm and Sea," says the sulphate of magnesia should be added on New England soil. We can by this method, ascertain the agricultural properties of soils and by its aid construct true agricultural maps, by means of experimental fields disseminated through the country upon lands belonging to the different geological formations.

There exists four regulating agents *par excellence* in the production of vegetables: Nitrogenous matter, phosphate of lime,

potash and lime. To preserve to the soil its fertility, we must supply it periodically with these four substances in quantities equal to those removed by the crops. All arable land contains a portion of these necessary elements. It has been long admitted that the soil will not yield crops without manure, and the best manure found in practice is the *dunghill*.

ANALYSIS OF MANURES FROM DIFFERENT ANIMALS.—*Stockhardt.*

FRESH EXCREMENT.				FRESH URINE.			
IN 1,000 POUNDS.				IN 1,000 POUNDS.			
	Nitrogen.	Soda and potash.	Phosphate.		Nitrogen.	Soda and potash.	Phosphate.
COWS.....	3	1	2 $\frac{1}{4}$	8	14	.....	.....
HORSE.....	5	3	3 $\frac{1}{2}$	12	15	.....	.....
SHEEP.....	7 $\frac{1}{2}$	3	6	14	20	.....	.....
HOG.....	6	5	4 $\frac{1}{2}$	3	2	.....	.....
HUMAN.....	7	3 $\frac{1}{2}$	5 $\frac{1}{2}$	10	2	1 $\frac{1}{2}$	.....

Of 100 lbs. of nitrogen, in the food of a cow, 40 are lost, 48 remain in the manure, and 12 goes to milk.

To obtain this manure we must raise or keep stock; to feed it requires pasture. If all the crops are consumed on the farm by the animals, we find in their excrements almost the whole of the phosphates and potash contained in their food. About two-thirds of the nitrogen would be returned to the soil in the manure, the loss of the other third would impoverish the farm unless an equivalent be found in clover which mostly derives its nitrogen from the atmosphere. Thus the raising of cattle does not sensibly impoverish the farm.

By the use of the new method we may abolish the old practices and replace them by a simpler agriculture, more manageable and more remunerative. Instead of, by great care and precaution maintaining the fertility of the soil, we *reconstitute* it by means of the four agents pointed out, which can be derived from the

great storehouse of nature and added to the usual stock of farm manure. *No rotation of crops is necessary*, no cattle. We produce at will the crop which best serves our interest and export the whole, if to our advantage. We cultivate the same crop upon the same soil, indefinitely, if we desire. *The soil is merely a medium of production* in which we convert at pleasure the four agents in the formation of plants into this or that crop as suits us. All that is required is to maintain these four elements in sufficient proportion that the crops may obtain the quantity their organization demands. We hold the balance in our own hands and as one of the scales tends to rise we restore the equilibrium by loading the other.

In the old system the balance was maintained blindly, frequently *one* of the useful elements failed and the crops were also deficient. In the new, the plants finding in abundance all they require, always attain their largest possible growth; the crops are also much more abundant as may be seen by the following table:

YIELD PER ACRE.

OLD PROCESS.	NEW PROCESS.
WHEAT, { Straw, 8,250 lbs. Grain, 3,639 " } 11,889 lbs.	WHEAT, { Straw, 15,270 lbs. Grain, 8,250 " } 23,520 lbs.
PEAS... { Straw, 5,414 lbs. Grain, 2,166 " } 7,610 "	PEAS... { Straw, 10,014 " Grain, 2,849 " } 12,863 "
BEETROOT ROOTS,..... 6,978 "	BEETROOT ROOTS,..... 20,110 "

Complete manure creates fertility everywhere; but it is not necessary always and everywhere to have recourse to so expensive a compound. By suppressing the nitrates, the yield of wheat is considerably reduced, but that of peas and vegetables is not affected. Suppress potash and the yield of vegetables suffers most; phosphate of lime, turnips, parsnips and roots generally will show the worst effects. Thus, in each kind of crop there is one element which exercises a more particular influence upon the yield.

(Patent Office Report.)

ANALYSIS OF DIFFERENT CROPS.

	Potash.	Phosphate of lime.	Magnesia.	Lime.
WHEAT.....	Grain,.....	30.00	46.00	12.00
	Straw,.....	13.00	5.00	3.00
CORN.....	Grain,.....	32.5	44.9	1.4
	Stalk,.....	9.6	7.1	6.00
OATS.....	Grain,.....	16.8	18.2	7.7
	Straw,.....	19.1	2.6	3.9
RYE.....	Grain,.....	26.00	46.3	11.2
	Straw,.....	17.2	3.8	4.2
BARLEY.....	Grain,.....	19.8	35.2	8.6
	Straw,.....	18.4	3.1	2.6
POTATOES...	Tubers,.....	55.8	12.6	5.3
	Tops,.....	28.1	7.6	7.1
PEAS.....	Peas,.....	36.3	33.5	8.5
	Straw,.....	4.7	4.8	54.9
BEANS.....	Beans,.....	33.3	37.6	8.00
	Straw,.....	53.1	7.2	5.8
TURNIPS.....	Bulbs,.....	37.00	9.7	6.7
	Tops,.....	28.7	9.3	20.00
CLOVER.....		55.5	8.4	32.8
LUCERNE.....		14.6	13.7	3.6
MEADOW.....		21.7	9.9	50.6
				13.9

The following law will, therefore, regulate the new practice:

Although the presence of the four agents of fertility in the soil is necessary and indispensable for all plants, the necessities of various cultivations are not the same in regard to the quantities of each of these agents; ie.: each crop has its leading one.

If we wish to cultivate a piece of poor land, we begin by giving it the complete manure to create a sufficiency of the four agents

of fertility. We raise one or two crops of cereals upon this manure; then give, each year, the dominant element of the crop we propose to raise. If we adopt a rotation of four years with such crops that, at the end, has received the four agents, we can continue thus indefinitely without ever requiring the complete manure. The same system is applicable to a fertile soil; only we may dispense with the first dose of complete manure, and commence with the dominant element of the first crop we desire to raise.

If we wish to continue the same crop indefinitely, we employ its dominant; taking care to apply the complete manure as soon as a reduction in the yield shows the necessity of so doing. By these simple combinations we are in possession of a new method of agriculture much more powerful than its predecessors.

Formerly, the total matter placed by nature at our disposal was limited; all that the old systems could do was to maintain the fertility, not increase it.

Under the influence of the new method matters at present without value, which scarcely serve as materials of construction and of which nature possesses inexhaustible stores, can be converted into vegetable products, forage, to nourish the animals upon which we feed; and cereals, to produce bread, the most valuable of our resources.

To combine the agents of fertility which have reposed in geological strata since the foundations of the earth were laid, to place them at the disposal of the small farmer, will be to give fertility to millions of acres devoted to the small farmer, and create prosperity among millions occupied in agricultural industry.

Practical experience has proved that with this complete manure it is possible to raise abundant crops,—that the increase of yield has been more than three tons per acre. The following results show *for themselves*:

No. 1.—WHEAT.—Third crop from the same land without fresh manure since the first application.

CROP PER ACRE.	WITHOUT MANURE.	WITH COMPLETE MANURE.
No. 1.....	{ Straw,.... 704 lbs. Grain,.... 198 " }	897 lbs. | { 5,913 lbs. 2,464 " } 8,377 lbs.

No. 2.—WHEAT.—Fourth crop, without fresh manure since the first.

	WITHOUT MANURE.	WITH COMPLETE MANURE.
No. 2.....	{ Straw,.... 1,074 lbs. Grain,.... 316 " }	{ 1,390 lbs. 4,629 lbs. " 1,760 " }

No. 3.—COLZA (a species of Cabbage).—After two crops of Barley, without fresh manure.

	WITHOUT MANURE.	WITH COMPLETE MANURE.
Straw,....	5,632 lbs.	{ 6,952 lbs. 7,700 lbs. Grain,.... 1,320 " }

No. 4. BEETROOT.

	WITHOUT MANURE	WITH COMPLETE MANURE.
1861.....	{ Leaves,.... 14,696 lbs. Roots,.... 14,616 " }	{ 59,312 lbs. 14,344 lbs. " 47,900 " }
1862.....	{ Leaves,.... 7,040 " Roots,.... 12,056 " }	{ 19,096 " 9,680 " " 21,820 " }
1863.....	Crops destroyed by worms.	
1864.....	{ Leaves,.... 6,204 lbs. Roots,.... 16,544 " }	{ 22,748 lbs. 6,618 lbs. " 24,990 " }

No. 5.—After two crops without manure.

COMPLETE MANURE.

Leaves,....	7,700 lbs.	{ 38,324 lbs.
Roots,....	30,624 "	

No. 6.—After three fine crops of wheat without fresh manure.

COMPLETE MANURE.

Leaves,....	7,304 lbs.	{ 44,130 lbs.
Roots,....	36,826 "	

GUANO.

GEORGE E. WHITE,
150 FRONT STREET,
NEW YORK.

**No. 1 Peruvian Guano,
Crushed Bones,
Bone and Meat,
Fish Guano,
Best Superphosphates,
Sulphate of Soda,
Swan Island Guano,
Alta Vela Guano,
Bruce's Fertilizer.**

Geo. E. White's Superphosphate is guaranteed to contain over eleven per cent. of Soluble Phosphoric Acid, and three per cent. Ammonia.
Price, \$50.00 per ton.

No. 1. Peruvian Guano is sold at \$61 (gold) per ton of 2,240 lbs.

Full descriptive catalogues sent to all applicants.

N. B.—The larger part of my business is in furnishing materials to manufacturers of fertilizers.

G. E. WHITE.

TO FARMERS.

INSURE A LARGE AND EARLY CROP BY APPLYING THE

ALTA VELA PHOSPHATE.

PRACTICAL FARMERS IN ALL SECTIONS OF THE COUNTRY PRONOUNCE
IT TO BE THE BEST FERTILIZER USED. IT CONTAINS
THREE PER CENT. OF

A M M O N I A ;

AN AMPLE QUANTITY TO GIVE ACTIVITY WITHOUT INJURY, AND
NEARLY FIFTY PER CENT OF PURE

BONE PHOSPHATE OF LIME.

TOGETHER WITH OTHER VALUABLE INGREDIENTS.

It is particularly adapted for application to Tobacco, and the rapidly increasing sales to farmers who are using it on general crops, with highly satisfactory results, is a sure guarantee of its value.

Price \$56 per ton of ten bags, 200 pounds each. Delivered at any part of New York City.

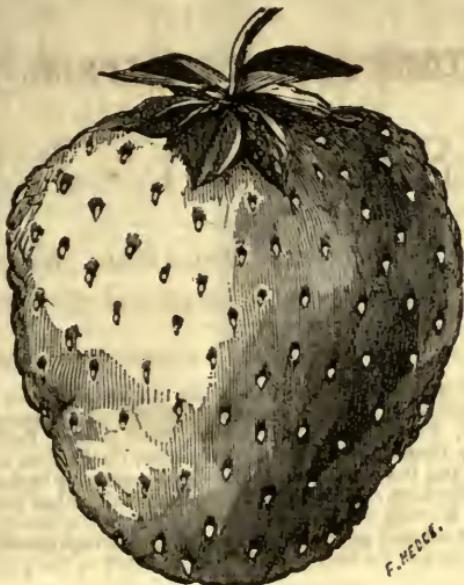
Address all orders to

THE ALTA VELA GUANO COMPANY,

No. 57 Broadway, New York.

READING NURSERY.

A general stock grown on light soil, under the personal care of the proprietor.
(Send stamp by mail and receive my illustrated descriptive priced catalogue.)



JUCUNDA STRAWBERRY,

Natural size, \$1.00 per dozen, post-paid. 20 other varieties of Strawberry plants
by the dozen or one hundred.

APPLE, PEAR, PEACH, CHERRY, AND PLUM TREES,
Of standard and dwarf habit.

20,000 HARDY GRAPE VINES,
In large variety.

20,000 EVERGREEN TREES,

Numerous hardy species, 6 inches to 4 feet high, and upwards.

FLOWERING SHRUBS, ROSE, CLINGING VINES,
For arbors, &c.

MAPLE, ELM, AND OTHER SHADE TREES,
Of various kinds.

CURRENT AND GOOSEBERRY BUSHES; RASPBERRY AND
BLACKBERRY PLANTS, &c.

Of the older varieties; also the new sorts, claiming patronage of the public.

Address J. W. MANNING,

READING, MASS.,

UNION MOWING MACHINE.

WHITCOMB'S METALLIC SPRING-TOOTH HORSE HAY-RAKE.

The best Horse Hay-Rake Known.

The subscriber being agent for the sale of the above machines for the following towns: Hollis, Milford, Merrimack, Amherst, Mt. Vernon, Lyndeboro', Greenfield, Hancock, Antrim, Bennington, Francestown, New Boston, Bedford, Manchester, Goffstown, Weare, Deering, Hillsborough, Windsor, Dunbarton, Bow, Hooksett, Allenstown, Candia, and Deerfield, would take this opportunity to thank the public for the very liberal patronage of the past six years in which he has been engaged in the sale of the Union Mowing Machine, and would solicit a continuance of their favors, *as the Union comes out this year with new and valuable improvements*, which makes it one of the best—if not the best—machine ever offered to the public.

R. M. ROLLINS, Agent,

At A. D. Eastman's Depot Store, Piscataquog,

MANCHESTER, N. H.

ALSO,

FIELD'S PATENT EXTENSION

CARRIAGE JACK,

The best Jack ever in use, which every person having a carriage should have.

ROLLINS & DODGE, Proprietors.

E. P. FRENCH'S

IMPROVED

PATENT BEE COTTAGE

Claims superiority over others for all seasons of the year, because of an air-space around the brood-box which renders it cool in the hottest days of summer, enabling the bees to work instead of clustering on the outside of the hive.

The feed-box is so arranged that the bees may be fed at any time without danger of robbery by other swarms.

The ventilation is such as to prevent the collection of moisture, which causes the loss of many swarms by frost and mould in winter.

The air-space about the brood-box causes the bees to commence hatching much earlier in the season, causing a greater increase of bees as well as honey.

Portions of the frames of the brood-box may be removed at any time so as to raise queen bees and make swarms at pleasure, thus avoiding their escape as well as the anxiety and loss of time in watching for natural swarms to come off.

The store honey may be removed in large or small boxes, or frames with ease and safety.

WILMINGTON, VT., Sept. 30, 1867.

MR. E. P. FRENCH — *Dear Sir* : — I thought I would drop you a line and inform you what success I have had with your Patent Bee Hive. I think it the best hive I ever saw. I will give you an account of what I have done in four years. Three years ago I wintered seventeen swarms of bees and got 80 pounds of surplus honey. The two years I have cleared \$250 each year. Last winter I wintered forty-six swarms, and the past summer I have had about one ton of the best of honey, and thirty-three swarms increase, which gives me now seventy-nine swarms of bees. (You can figure the amount of profit yourself.) I have not stripped everything in this region as far as I can hear.

Yours truly, CLARK HARRIS.

RIGHTS FOR SALE

Address E. P. FRENCH,

BEDFORD, N. H.

N. B. — Mr. French has a recipe for making bee-feed which will not become can-died. The recipe will be forwarded to any address upon receipt of ten cents.



**KNIFFIN MOWERS
AND
WHEEL RAKES,**
Acknowledged to be superior to any other.

MANUFACTURED BY
**KNIFFIN MOWING MACHINE COMPANY,
WORCESTER, MASS.**

Send for circular.

TO FARMERS AND GARDENERS.

CRUSHED BONE,
GROUND BONE AND BONE MEAL,
IN QUANTITIES TO SUIT PURCHASERS.

ALSO THE BEST THING IN THE MARKET FOR
CASE HARDENING.

FOUND AT

NORTHBORO' BONE MILL,
NORTHBORO', - - - MASS.
J. B. ROOT.

R. J. P. GOODWIN'S PATENT IMPROVED BOX FLAT-IRON.

For Families, Tailors, Laundries & Manufactories.

The great labor and fuel-saving Invention of the age. By its use more ironing can be done, and neater and better, in one hour, than in three hours by the old method.



The use of this Iron does not interfere with cooking or washing, and does not require room upon the top of the stove to be heated like other irons.

The Iron, as seen on referring to the engraving, Fig. 1, consists of a box with a hinged cover, enclosing a cast-iron slug or heater, which is placed on the hot coals, heated red hot, and transferred to the box by a common poker; the cover is closed, Fig. 2, and the Iron is ready for use. This Iron can be heated by a parlor stove, chamber air-tight, or wherever fire is to be had,—a fact which has never been attained in the use of common irons. By its use you need be troubled no more with rusty irons, as the longer in use the smoother the face of the iron becomes.

DIRECTIONS.

It is better to commence ironing immediately after introducing your heater into the box. By this means a uniform heat is preserved.

After finishing your ironing, rub over the polished surface a cloth moistened slightly with sweet oil, and kept for that purpose; place your Iron in a flannel bag or box, set it away in a dry closet, and your Iron, with proper care, will last a life time. Two of the heaters are furnished with each Iron, so that one may be heating while the other is in use.

AGENTS WANTED TO SELL THIS IRON IN EVERY TOWN, CITY and STATE

The above Iron has been thoroughly tested in our Shoe Manufacturing Establishments in Lynn, Mass., and has proved itself able to press 40 pairs of ladies' boots in 25 minutes without changing the heater, or any interruption of the work; the most ever done by any iron heretofore were 10 pairs. We adopt and recommend it in preference to all others.

WM. MAXWELL, Foreman of Geo. W. Keene & Son; GEO. HOVEY, Foreman of A. F. Breed; JOHN LOW, Foreman of D. F. Doak; D. B. & C. BUFFUM.

At a meeting of the New York Farmers' Club, held at the American Institute, New York City, March 10, 1868, Goodwin's Patent Box Flat-Iron was exhibited by Chas. M. Bowman, Esq., and received the highest praise for its beauty, simplicity, and practical merits. It was recommended as highly economical in its use.

R. J. P. GOODWIN & CO., Manufacturers, Manchester, N. H.

CLARK'S COMPOST.

CLARK'S COMPOST and method of chemicalizing manure and tilling the soil, rendering the whole mass of manure about equal to the best guano or superphosphate of lime, and saving the farmer fifty per cent. of hard labor in tilling the soil. The chemicals cost about three dollars per acre, and are all neat, clean and easily produced in all New England towns. This chemicalized manure is adapted to all kinds of soil, especially light soil, and will hold out when laid down to grass fifteen or twenty per cent longer than crude manure; it is as perfect as any thing can be made for all kinds of fruit trees and vines, giving them healthy growth, and inducing them to fruit when all else fails. It gives little or no trouble to prepare it, and herein lies its great value. The receipt for top-dressing, under my management, will cause to grow, five or six tons of hay per acre, and using only one cord of chemicalized manure; it will do the same for all others under like circumstances. To illustrate its effects on all spring crops, a farmer may take twelve cords of crude manure, and I will take five or six cords and chemicalize it, and produce the same result on the same quality of soil, and not do but about half the amount of labor he does. There must be no fertilizer put in the hill where this manure is used. It takes the place of the superphosphate. To sum it all up in one sentence, give me an old worn-out farm, with vitality all exhausted, and two cords of crude manure per acre, in the fall, and if the next season is medium for grass, I will fill the old barn with good hay, if ever it was filled in one year by that farm. My seventeen years' experience was conducted on just such a farm. I am now prepared to impart the information derived from those experiments to all who desire it. One receipt is for top dressing, the other for all spring crops, and are five dollars each. Any one desiring one or both of them can have them by copying and signing the following obligation, with town and state, sending it to me together with the money; or if a sufficient number in a neighborhood desire me to deliver them in person, please address me.

OBLIGATION.—We, the undersigned, on our honor, pledge ourselves not to divulge the secret of Clark's Compost, or compound it for any one but for our own use, unless authorized by Josiah Clark, its original discoverer.

N. B.—The farmer and fruit man will see by my advertisement I increase the value of the manure only 50 per cent.; but in reality I can make one cord equal to four in its crude state, and the material for chemicalizing it will not exceed three dollars per acre, and all can do as well with the same care. I desire no agents, at least for the present. The above statements are all true to the letter; therefore let no one be deterred from sending for fear of purchasing a humbug, for that is an article I never deal in.

These receipts are the result of seventeen years careful experimenting and observation, wholly for my own gratification and pleasure, without any thought of publishing them to the world until the fall of 1867. The top dressing receipt will enable a farmer to keep his farm in grass without plowing.

VOUCHERS.—We have known Mr. CLARK for many years; he is a man of good standing, honest and responsible; he says what he believes to be true.

FREDERICK SMYTH, Ex-Governor of New Hampshire.
PHINEHAS ADAMS, Agent, Stark Mills, Manchester.
WATERMAN SMITH, Manchester.
JOSEPH B. CLARK, Ex-Mayor of Manchester.
JOHN B. CLARKE, Editor Mirror, Manchester.
HON. DANIEL CLARK, Judge U. S. Court, Manchester.

Post Office address:

JOSIAH CLARK, Manchester, N. H.

SEEDS! SEEDS!

THE CHOICEST STOCK OF

HERDS GRASS, CLOVER,
BROWN AND RED-TOP SEEDS.

— ALSO, —

EARLY SEED POTATOES,
OF CHOICE VARIETIES,
SEED PEAS, BEANS,

— AND —

GARDEN SEEDS,

By the pound or paper, from the best Growers in the country.

FLOWER SEEDS,
GREEN-HOUSE PLANTS, &C., &C.

In fact you can find everything the farmer or gardener wants, and the lowest market prices, at

HENRY C. MERRILL'S
Wholesale and Retail Seed and Grocery Store,
No. 5 PATTEN BLOCK,
MANCHESTER, N. H.

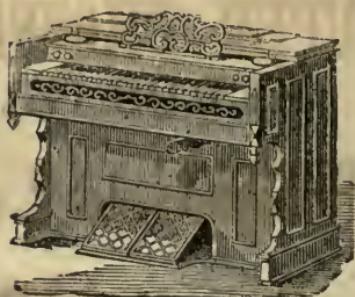
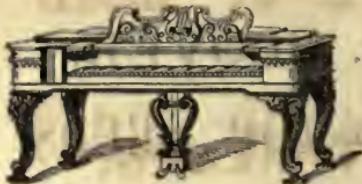
EARLY GOODRICH POTATOES.

The earliest and most productive potatoes in the market. Last season one farmer raised *fifty-six pounds* suitable for market from *two potatoes* which weighed *eight ounces*.

A few bushels for sale by

HENRY C. MERRILL,
No. 5, Patten Block, Manchester, N. H.

WHITNEY'S MUSIC STORE,



176 ELM STREET, - - MANCHESTER, N. H.

THE SUBSCRIBER IS SOLE AGENT FOR THE

WEBER & MILLER PIANO,

— THE —

CHURCH AND CABINET ORGAN OF PELOUBET

— AND THE —

**CELEBRATED
AMERICAN ORGAN**

Of W. H. & S. D. SMITH,

SO RAPIDLY COMING INTO FAVOR.

Pianos of all grades and prices, from the leading Boston manufactory, to sell, rent or exchange. Melodeons, Seraphines, and all kinds of wind, keyed and stringed instruments; Sheet Music and Music Books constantly on hand; new songs received as soon as issued. Aim of proprietor to keep a

FIRST - CLASS MUSIC STORE,

And to sell his goods at the lowest living rates. Instruments tuned and repaired.

I. S. WHITNEY,

Teacher of Vocal and Instrumental Music,

PROPRIETOR.

NATIONAL

SUPER-PHOSPHATE OF LIME
A N D
CHEMICAL FERTILIZERS,

MANUFACTURED BY
JAMES H. STEVENSON & CO.,
No. 132 South Second Street,
PHILADELPHIA.

The best and earliest (July 16, 1867) *potatoes* were brought to Manchester, N. H. market last year by ISAAC N. RIDDLE, Esq., of Bedford, N. H. References as to *quality and date* may be made to Dea. CHARLES GAGE, Bedford, N. H.; JOHN B. CLARKE, Esq., Editor of Mirror, HENRY C. MERRILL, Esq., KIDDER & CHANDLER, and other Grocers, Manchester, N. H.

They were raised by the use of the

NATIONAL SUPER-PHOSPHATE OF LIME,

For which *early orders to insure a supply* may be sent to

Mr. SILAS A. RIDDLE,

BEDFORD, N. H.,

Or left for him at the office of

ISAAC RIDDLE, Esq.,

193 ELM STREET,

MANCHESTER, N. H.

J. S. KIDDER & CO.,

DEPOT STORE,

— DEALERS IN —

FLOUR, GRAIN, LIME, CEMENT,

&C., &C.

ALSO, BAUGH'S

COMMERCIAL MANURES,

For all crops and plants. Manufactured by

BAUGH & SONS, PHILADELPHIA,

NORTHWESTERN FERTILIZING COMP'Y,

CHICAGO.

Baugh's Raw Bone Phosphate,

Baugh's Chicago Bone Fertilizer,

Baugh's Chicago Blood Manure.

For detailed description of these articles, call or send for circular.

COMMISSION MERCHANTS

MANCHESTER. N. H.

J. S. KIDDER.

CHAS. H. HILL.

AMOSKEAG SAVINGS BANK.

AMOUNT OF DEPOSITS, \$1,943,450.43.

MOODY CURRIER, President and Treasurer.

GEORGE B. CHANDLER, Cashier.

WM. B. LANE, Book-Keeper.

This Bank has paid its Depositors for the last five years SEVEN per cent. compound interest.

Regular dividends, July 1, — once a year. Surplus dividends once in five years.

March 25, 1868.

GUANO!

J. S. KIDDER & CO.,

DEPOT STORE, MANCHESTER, N. H.,

Have on hand, and will sell at prices which will suit purchasers, in bulk or barrels,

A PURE BIRD GUANO,

Warranted to contain by actual analysis,

50 PER CENT. OF BONE PHOSPHATE OF LIME,

OR EQUIVALENT,

An article which is highly recommended by persons who have tried it.
Testimonials furnished by persons in this vicinity.

March 24, 1868.

THE
NOVELTY SEWING MACHINE,



**EMBROIDERING AND BRAIDING
MACHINE.**

— LICENSED BY —

Wheeler & Wilson, and Singer Sewing Machine Co's.

It was awarded the first Bronze Medal at the Lowell State Fair above all other competitors.

It is simple, cheap, and not liable to get out of order; runs still, easy and fast, and requires little mechanical skill to operate; the needle is short and straight, therefore less liable to break than long or curved needles.

It sews all kinds of Cotton or Linen direct from the original spool.

The seam is elastic, strong, and especially adapted for all work that requires frequent washing and ironing. Its beautiful structure is such, that though it be cut every third stitch, the cloth cannot be pulled apart without tearing.

THIS MACHINE HAS A BRAIDING ARRANGEMENT,

A part of the Machine, and not an uncertain attachment, by which the most beautiful Embroidering in Braid can be made with as little skill as is required in ordinary plain Sewing.

The formation of the stich is such that it is particularly adapted for Embroidering in Silk, and the ease with which the work can be turned enables the operator to work out the most intricate and elegant designs.

It works equally well turned either way; has the self-adjusting pressure foot and underfeed; is made from the best material, in the most thorough manner, and, with proper care, will last a lifetime.

Agents wanted to sell these Machines in every state and county. For terms, &c., address the manufacturer.

W. S. HILL, Manchester, N. H.

BOWER'S COMPLETE MANURE.

MADE FROM

SUPER-PHOSPHATE OF LIME,

AMMONIA AND POTASH.

Warranted free from adulteration.

Contains the elements to produce large crops of all kinds, and is highly recommended by all who have used it. Packed in bags of 200 pounds each. Price, \$56 per ton — 2,000 pounds. Discount to dealers.

DIXON, SHARPLESS & CO.,

39 South Water St., and 40 South Delaware Ave.,

PHILADELPHIA,

SOLE AGENTS,

And for sale by dealers generally throughout the country.

Manufactured by HENRY BOWER, Chemist,

PHILADELPHIA.

Orders received by SILAS A. RIDDLE, Esq., Bedford, N. H.; or left at the office of Mr. ISAAC RIDDLE, 193 Elm Street, Manchester, N. H.

GOOD WORK—GOOD STOCK—FAIR PRICES



C. F. Livingston
DOES
PRINTING
.. AT ..
SMYTH'S BLOCK.

*Prints anything from a Wedding or Address Card,
to History of Second New-Hampshire Regiment,
or other good-looking work.*

KEEPS A SUPPLY OF STANDARD STATIONERY,

Note Paper, .. Letter Paper, .. Cap Paper,
Billhead Paper, Envelopes, &c.,

Which he furnishes to customers, printed or plain, at a very
small advance on wholesale prices.

CALL AND SEE.

13, 14, 15, 16, SMYTH'S BLOCK, MANCHESTER, N. H.



SEED POTATOES.

“GARNET CHILI.”

The progenitor of the **EARLY ROSE**, which has been selling this spring at *one hundred dollars per bushel*,—mealy, fine flavor (nearly equal to the Carolina potatoes), and a very prolific bearer.

A few bushels for sale by

RODNIA NUTT, Manchester, N. H.

3
659
R5

AGRICULTURAL WAREHOUSE, NO. 1 PATTEN BLOCK.

DANIELS & COMPANY

HAVE IN STORE A LARGE STOCK OF
FARM IMPLEMENTS,

Doe Plows; Shovels and Spades; Manure Forks, square and round Tine; Spading Forks; Churns, Davis' Patent; Cylinder and Dash Churns; Butter Moulds; Cheese Presses; Cheese Hoops and Baskets; Cultivators, Iron and Wood Frames; Patent Harrow Teeth; Crow Bars; Trace Chains; Draft Chains; Grindstones; Wheelbarrows; Dry Measures &c.

FERTILIZERS.

E. FRANK COE'S
SUPER-PHOSPHATE OF LIME,

Uniform in quality, and unexcelled by any in market.

AMMONIATED PACIFIC GUANO,
POUDRETTE, PERUVIAN GUANO,
BONE MEAL.

GRASS, GARDEN AND FIELD SEEDS,

In large variety, and from the most reliable growers.

EARLY GOODRICH POTATOES, GENUINE.

NO. 1 PATTEN BLOCK,
MANCHESTER, N. H.